

CLAIMS

1. An optical power control system configured for use with a wavelength division demultiplexer, said optical power control system comprising:

5 a plurality of photodetectors connected so as to monitor output power on a plurality of outputs of said demultiplexer, each of said outputs carrying a different WDM channel; and

a gain control system that receives power level indications from said plurality of photodetectors and controls a gain of an optical amplification system providing input to
10 said demultiplexer; and

wherein said gain control system sets a gain of said optical amplification system such that a power level indication based on said output powers monitored by said plurality of photodetectors is set within a desired range.

15 2. The system of claim 1 wherein said power level indication comprises an average of said output powers monitored by said plurality of photodetectors.

3. The system of claim 2 wherein said desired range corresponds to an optical receiver dynamic range.

20 4. The system of claim 1 further comprising:

an optical filter having dynamically controllable response characteristics, said optical filter receiving input from said optical amplification system and outputting a filtered optical signal to said demultiplexing system.

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5. The system of claim 4 wherein said optical filter comprises a tilt control filter.

6. The system of claim 4 wherein said gain control system sets a tilt of said tilt control filter to reduce a difference in monitored output powers for a highest WDM

10 channel and a lowest WDM channel.

7. A WDM receiver system comprising:

an optical amplifier system having variable gain and receiving a WDM signal comprising multiple wavelengths;

15 a demultiplexer receiving an amplified WDM signal from said optical amplifier system and separating said amplified WDM signal into a plurality of single wavelength signals each corresponding to a different WDM channel;

a plurality of photodetectors monitoring power levels of said plurality of single wavelength signals; and

20 a gain control system that receives power level indications from said plurality of photodetectors and controls a gain of said optical amplifier system such that a power level indication based on said output powers monitored by said plurality of photodetectors is set within a desired range.

8. The system of claim 7 wherein said power level indication comprises an average of said output powers monitored by said plurality of photodetectors.

5 9. The system of claim 8 wherein said desired range corresponds to an optical receiver dynamic range.

10. The system of claim 7 further comprising:

an optical filter having dynamically controllable response characteristics, said
10 optical filter receiving input from said optical amplifier system and outputting a filtered optical signal to said demultiplexer.

11. The system of claim 10 wherein said optical filter comprises a tilt control filter.

15 12. The system of claim 10 wherein said gain control system sets a tilt of said tilt control filter to reduce a difference in monitored output powers for a highest WDM channel and a lowest WDM channel.

13. In a WDM receiver system, a method for controlling power on multiple WDM
20 channels, said method comprising:

monitoring output powers on individual ones of said multiple WDM channels;
determining a power level indication based on said monitored output powers; and
setting amplification on a signal including said multiple WDM channels so that
said power level indication falls within a desired range.

14. The method of claim 13 wherein said power level indication comprises an average of said monitored output powers.

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15. The method of claim 13 further comprising:
using a demultiplexer to separate said multiple WDM channels into individual wavelength signals.

10 16. The method of claim 13 further comprising:
filtering said signal including said multiple WDM signals to adjust gain tilt among said multiple WDM channels.

15 17. The method of claim 16 wherein filtering comprises:
filtering said signal using filter response characteristics that reduce a difference in monitored output powers for a highest WDM channel and a lowest WDM channel.

18. In a WDM receiver system, apparatus for controlling power on multiple WDM channels, said apparatus comprising:
20 means for monitoring output powers on individual ones of said multiple WDM channels;
means for determining a power level indication based on said monitored output powers;

means for setting amplification on a signal including said multiple WDM signals so that said power level indication falls within a desired range.

5 19. The apparatus of claim 18 wherein said power level indication comprises an average of said monitored output powers.

20. The apparatus of claim 18 further comprising:
means for separating said multiple WDM channels into individual wavelength
10 signals.

21. The apparatus of claim 18 further comprising:
means for filtering said signal including said multiple WDM signals to adjust gain
tilt among said multiple WDM channels.

15 22. The apparatus of claim 21 wherein said filtering means comprises:
means for filtering said signal using filter response characteristics that reduce a
difference in monitored output powers for a highest WDM channel and a lowest WDM
channel.

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